

## On the Distribution of Emydid Turtles and the Anuran Genus *Microhyla* in the Philippines

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**Abstract.** -*Cuora amboinensis kamaroma* Rummeler and Fritz and *Microhyla annectens* Boulenger are reported from the Sulu Archipelago in the southwestern Philippines. The Philippines range of *Cyclemys dentata* (Gray) is extended to the Sulu Archipelago. The distribution of emydids and the genus *Microhyla* in the Philippines is discussed.

**Key Words:** Reptilia, Testudines, Emydidae, *Cuora amboinensis amboinensis*, *Cuora amboinensis kamaroma*, *Cyclemys dentata*, Amphibia, Anura, Microhylidae, *Microhyla annectens*, Philippines, distribution.

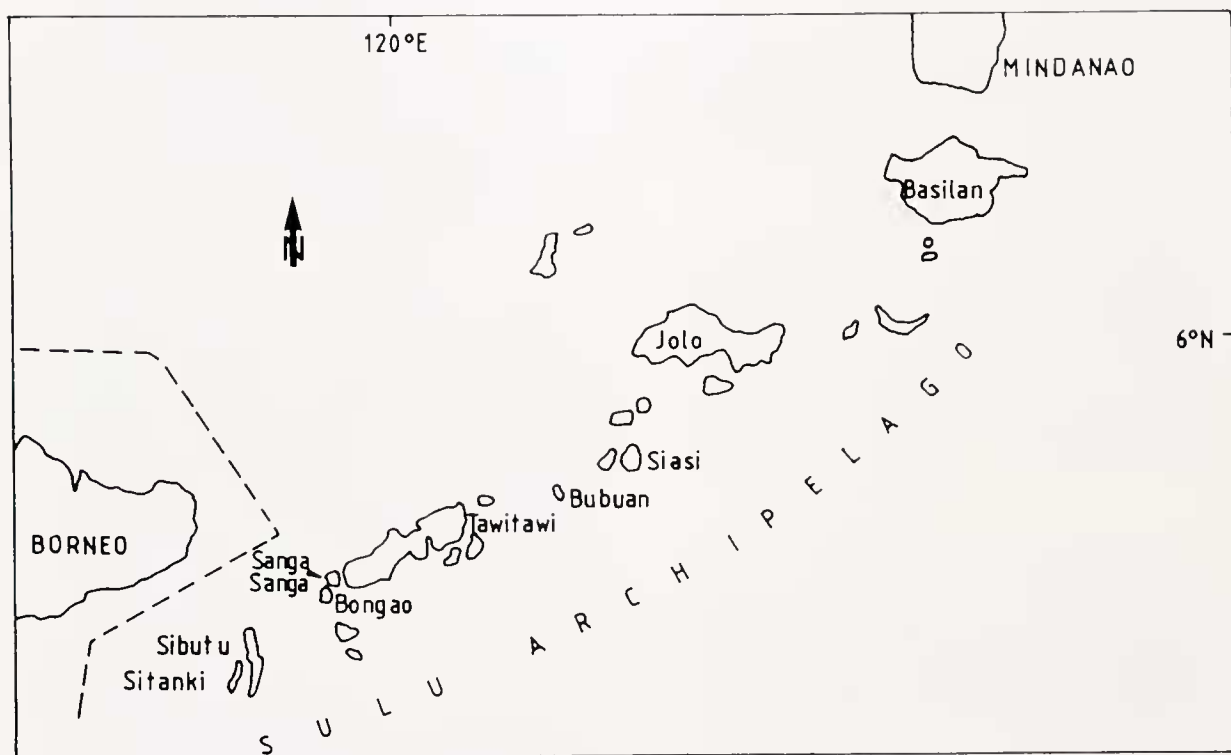


FIG. 1 Generalized map of the Sulu Archipelago.

### Introduction

The Philippines are separated into different faunistic regions (Brown and Alcalá, 1970, 1980; Dickerson, 1928; Inger, 1954; Leviton, 1963). The Sulu Archipelago, an island chain situated between Basilan and Mindanao to the east, and Sabah, Borneo, to the west, is one of

these regions. Faunistically it is more closely related to Borneo than to the Philippines. The only comprehensive work on the herpetofauna of the Sulu Archipelago is from Taylor (1918). Additions to its herpetofaunal record include for example Gaulke (1993, 1994), Leviton (1963) and Taylor (1922a, 1922b). Almost nothing is known of the emydid turtles of the region,

and knowledge on the anurans is also scarce. This work contributes to both of these subjects, and discusses the distribution of taxa in the groups in other parts of the Philippines.

### Material and Methods

The author has conducted field surveys in different regions of the Philippines since 1984. In the years 1990, 1991 and 1992 the following islands of the Sulu Archipelago were visited: Bongao, Sanga Sanga, Siasi, Sibutu, Tawitawi and Jolo (Fig. 1). Most of the turtles found were photographed and released after examination.

Three turtles (one *Cuora amboinensis kamaroma*, two *Cyclemys dentata*) are kept alive by the author, the microhylid frog (SMF 74908) and one *C. dentata* shell (SMF 74909) are deposited in the herpetological collection of the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany. The *C. amboinensis* subspecies were identified after Rummler and Fritze (1991), and the frog after Inger (1966).

### Results and Discussion

#### *Emydidae*

*Cyclemys dentata*. - On June 9, 1990, an adult specimen of *C. dentata* was caught in an undisturbed swampy lowland forest at Languyan on Tawitawi. Its faeces showed that it had fed on ripe figs before capture.

In 1991 and 1992 several, mainly juvenile, specimens of *C. dentata* were found in swamps and small creeks in different areas of Tawitawi (Batu Batu, Magsaggaw), proving that it is not a rare turtle on the island. It has not yet been found on any other island of the Sulu Archipelago.

Previously the known range of *C. dentata* in the Philippines included only the Palawan Province (Balabac, Palawan, Calamian Islands) and Leyte (Alcala 1986;

Taylor 1921). While it is common throughout the Palawan Province, records from Leyte are rare. Palawan and Leyte belong to different faunistic regions, and were never connected by a land bridge. Therefore it is surprising that *C. dentata* is known from both regions, but from nowhere in between. Three explanations can be offered for this disjunct distribution: 1. *C. dentata* exists on other Philippine Islands, but has not been recorded (or reported) until now. 2. *C. dentata* previously occurred on other Philippine islands, but became extinct subsequently on most of them, with a relict population surviving on Leyte. 3. *C. dentata* never reached the more eastern Islands of the Philippines, and the Leyte records rely on specimens introduced by man. This is not unlikely, since people often keep turtles as pets and for medicinal purposes (as rheuma remedy) leading to their translocation. *C. dentata* kept in captivity on Negros and Cebu were obtained on Palawan (pers. obs.).

The disjunct Philippine distribution of *C. dentata* is remarkably echoed by the third emydid turtle from the Philippines, the endemic *Heosemys leytenensis* (Taylor) which is also reported from Leyte and Palawan, but not in between island. Since both distribution records of this rare turtle rely on single individuals (Timmermann and Auth 1988; Taylor 1921), no assumptions on the reasons for the disjunct distributions can be made.

The Sulu Archipelago and Palawan lie in both Philippine entryways from Borneo, suggesting that the *C. dentata* populations have their origin on Borneo, where this turtle is widespread.

*Cuora amboinensis*. - In 1990 the author found *Cuora amboinensis* on the islands of Sanga Sanga and Tawitawi, and in 1992 on Jolo. During this period *C. amboinensis* was reported from Jolo (Rummler and Fritz 1991), who identified two specimens from Jolo (MNHN 6152:1-2, Musium Nationale d'Histoire Naturelle Paris) as *C. a. amboinensis*, as they did all Philippine



FIG. 2. Plastral view of three *Cuora amboinensis* from Jolo, showing that almost no dark markings are present on the plastron, as is typical for the subspecies *C. a. kamaroma* Rummler and Fritz.

material they studied. However, the specimens found during my trips on Sanga Sanga, Tawitawi and Jolo do not belong to the nominate form, but to the recently described *C. a. kamaroma* Rummler and Fritz. They have none, or very few, dark patches on their plastron (Fig. 2) and a high carapace, as is typical for this subspecies. U. Fritz, who kindly examined photos of some of the turtles captured on Jolo, mentioned that they are slightly flatter than other *C. a. kamaroma* he had seen, and the marginal scutes were slightly more visible from above. Nevertheless he confirms the determination as *C. a. kamaroma*, assuming that some interbreeding with Philippine *C. a. amboinensis* may have occurred.

*C. a. kamaroma*, the most widespread of the three subspecies of *C. amboinensis*, is known from Borneo, the Southeast Asian mainland, and now the Sulu Archipelago. *C. a. amboinensis* has a wide distribution over the Philippines, being reported from Bacoo, Cebu, Dinagat, Leyte, Luzon, Mindanao, Mindoro, Negros, Polillo and Samar (Boettger 1886; Rummler and Fritz 1991; Taylor 1921), but occurs on other Philippine Islands as well. The author, for example, has collected a few specimens on Masbate (currently being kept alive). Outside the Philippines, *C. a. amboinensis* is known from Sulawesi and the Moluccas. The Palawan Province is presently the only known Philippine Province not inhabited by any subspecies of *C. amboinensis*.

Rummler and Fritz (1991) consider the high domed *C. a. kamaroma* and the flat *C. a. amboinensis* as the evolutionary extremes of *C. amboinensis*, whilst the third subspecies *C. a. couro* (Schweigger), which occurs on Sumatra and Java, shows intermediate characteristics. They believe it possible that in the future high domed and flat forms of *C. amboinensis* may be found sympatric on Borneo, proving that they belong to different species. The record of *C. a. kamaroma* from the Sulu Archipelago shows that the Bornean form could reach the outskirts of the Philippines, but does not resolve the question of their phylogenetic affinities. It is surprising that within the Philippines two significantly different forms are found. *C. a. amboinensis* must either have developed from *C. a. kamaroma*, or reached the Philippines, via Mindanao, from the Moluccas or Sulawesi.

### Microhylidae

On March 18, 1991, the author collected one specimen of *Microhyla annectens* Boulenger (SMF 74908) in leaf litter beside a small pond in a lowland forest at Magsaggaw, Tawitawi. The species has a wide distribution on Borneo, Malaysia and Thailand, but was previously unknown from the Philippines.

Only one other member of the genus *Microhyla* has been recorded from the Philippines. Fischer (1885) reported *Microhyla achatina* (Boie) from Southern Mindanao, based on a single specimen. Boettger (1886) listed this frog, but mentioned that the specimen, according to a comment by G. A. Boulenger, most probably is not *M. achatina* but a *Kaloula* species. Taylor (1921) listed *M. achatina* without questioning the determination. However, he doubted the accuracy of the locality record, assuming that it might have come from another country. He also assumed that it might be from one of the high, little explored mountains on Southern Mindanao and therefore had not subsequently been found. Inger (1954) and Alcalá (1986) finally do not include *M.*



*achatina* in the Philippine amphibian fauna anymore.

Whether the record of *M. achatina* from the Philippines is true or not (the specimen is no longer available) must remain open, however, the new record shows that the genus *Microhyla* has reached the Philippines.

### Acknowledgments

I am grateful to Mr. R. Miller and Mr. Th. Borromeo, who were helpful in finding turtles on the Sulu Archipelago, and to the Provincial Department of Environment and Natural Resources in Bongao for allowing me to conduct surveys in their area, and to collect a few specimens. Dr. W. Branch kindly revised the manuscript, giving many helpful comments.

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